

CLAIMS

5 *SAC* 1. A retardation film comprised of a single oriented polymer film, characterized in that the retardation at wavelengths of 450 nm and 550 nm satisfies the following formulae (1) and/or (2), and the water absorption is no greater than 1%:

$$R(450)/R(550) < 1 \quad (1)$$

$$K(450)/K(550) < 1 \quad (2)$$

10 where $R(450)$ and $R(550)$ represent the in-plane retardation of the oriented polymer film at wavelengths of 450 nm and 550 nm, respectively, and $K(450)$ and $K(550)$ are the values calculated by $K = [n_z - (n_x + n_y)/2] \times d$ (where n_x , n_y and n_z represent the three-dimensional refractive indexes of the oriented polymer film as the refractive indexes in the direction of the x-axis, y-axis and z-axis, respectively, and d represents the thickness of the film) for the oriented polymer film at a wavelength of 450 nm and 550 nm, respectively.

15 2. A retardation film according to claim 1, wherein the retardation at wavelengths of 450 nm, 550 nm and 650 nm satisfies the following formulae (3) and (4):

$$0.6 < R(450)/R(550) < 0.97 \quad (3)$$

$$1.01 < R(650)/R(550) < 1.4 \quad (4)$$

20 where $R(650)$ represents the in-plane retardation of the oriented polymer film at a wavelength of 650 nm.

25 3. A retardation film according to claim 1 or 2, wherein the retardation is smaller with a shorter wavelength in the wavelength range of 400-700 nm.

30 4. A retardation film according to claim 1, which comprises an oriented polymer film wherein

35 (1) the film is composed of a polymer comprising a monomer unit of a polymer with positive refractive index anisotropy (hereunder referred to as "first monomer unit") and a monomer unit of a polymer with negative refractive index anisotropy (hereunder referred to as "second monomer unit"),

(2) $R(450)/R(550)$ for the polymer based on

said first monomer unit is smaller than R(450)/R(550) for the polymer based on said second monomer unit, and

(3) the film has positive refractive index anisotropy.

5 5. A retardation film according to claim 1, which comprises an oriented polymer film wherein

10 (1) the film is composed of a polymer comprising a monomer unit that forms a polymer with positive refractive index anisotropy (hereunder referred to as "first monomer unit") and a monomer unit that forms a polymer with negative refractive index anisotropy (hereunder referred to as "second monomer unit"),

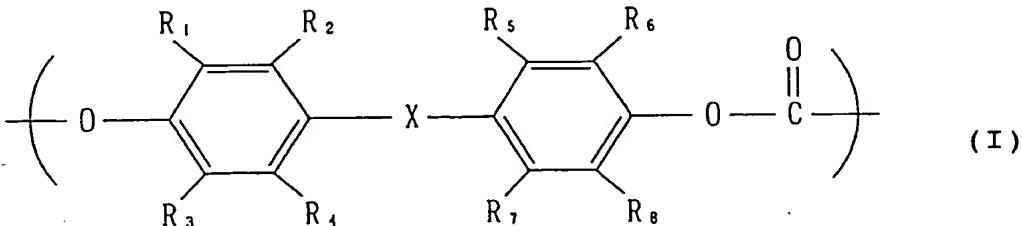
15 (2) R(450)/R(550) for the polymer based on said first monomer unit is larger than R(450)/R(550) for the polymer based on said second monomer unit, and

(3) the film has negative refractive index anisotropy.

20 6. A retardation film according to claim 1, wherein said oriented polymer film is made of a polymer material with a glass transition temperature of 120°C or higher.

25 7. A retardation film according to claim 1, wherein said oriented polymer film contains a polycarbonate with a fluorene skeleton.

8. A retardation film according to claim 1, which is an oriented polymer film comprising copolymer and/or blend of polycarbonates in which 30-90 mole percent of the total consists of a repeating unit represented by the following general formula (I):

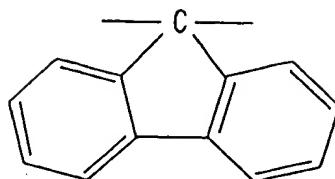


where R₁-R₈ are each independently selected from among hydrogen, halogen atoms and hydrocarbon groups of 1-6

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carbon atoms, and X is

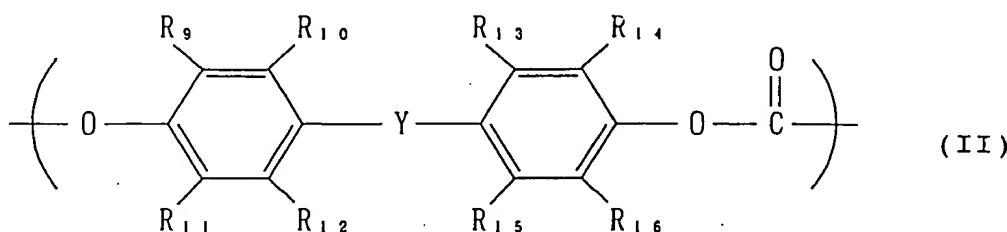
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and 70-10 mole percent of the total consists of a repeating unit represented by the following general formula (II):

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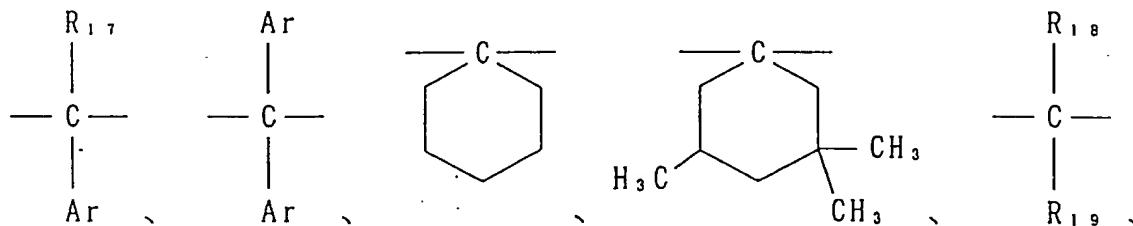
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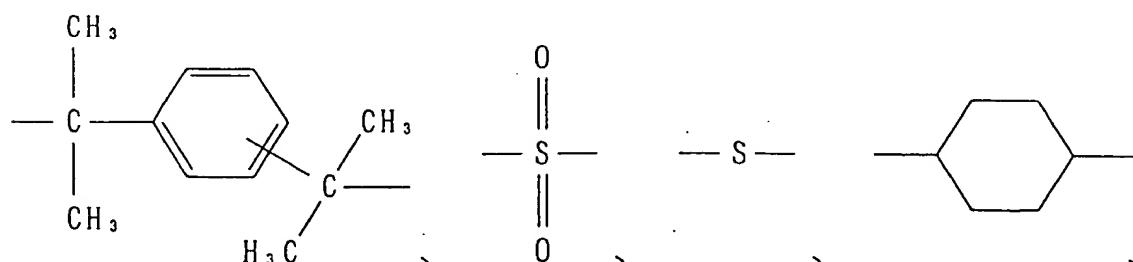
where R₉-R₁₆ are each independently selected from among hydrogen, halogen atoms and hydrocarbon groups of 1-22 carbon atoms, and Y is

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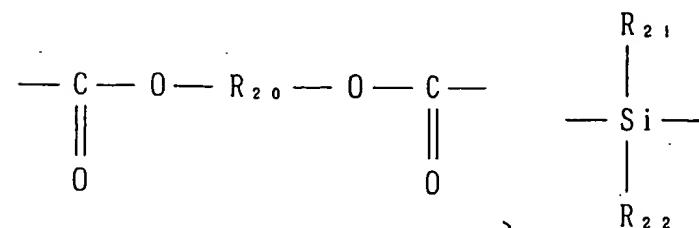
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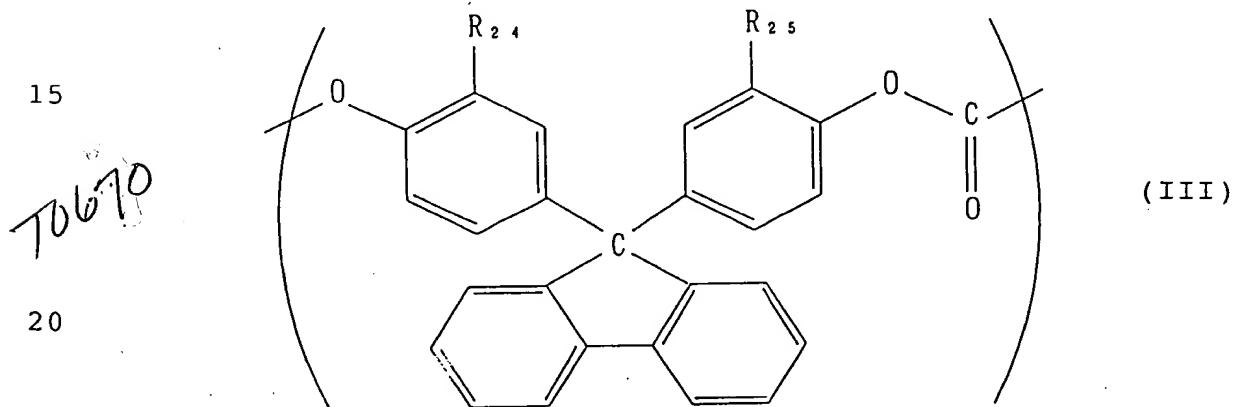


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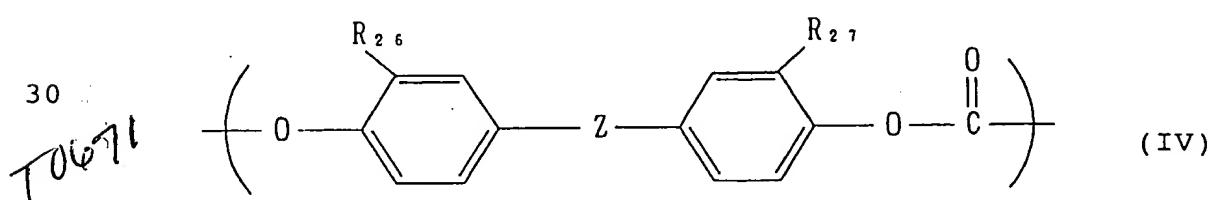
or $-R_{23}-$,

where in Y, R_{17} - R_{19} , R_{21} and R_{22} are each independently selected from among hydrogen, halogen atoms and hydrocarbon groups of 1-22 carbon atoms, R_{20} and R_{23} are selected from among hydrocarbon groups of 1-20 carbon atoms, and Ar is selected from among aryl groups of 6-10 carbon atoms.

9. A retardation film according to claim 8, which is an oriented polymer film comprising copolymer and/or blend of polycarbonates in which 35-85 mole percent of the total consists of a repeating unit represented by the following general formula (III):



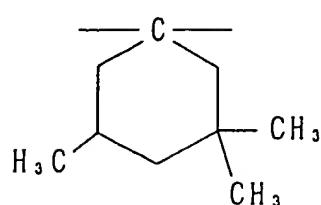
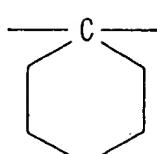
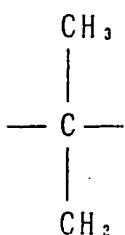
where R_{24} and R_{25} are each independently selected from among hydrogen and methyl,
25 and 65-15 mole percent of the total consists of a repeating unit represented by the following general formula (IV):



35 where R_{26} and R_{27} are each independently selected from among hydrogen and methyl,
and Z is selected from among

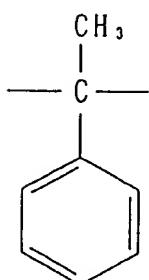
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10. A retardation film according to claim 5, which is a blended oriented polymer film in which said polymer with positive refractive index anisotropy is poly(2,6-dimethyl-1,4-phenyleneoxide) and said polymer with negative refractive index anisotropy is polystyrene, wherein the polystyrene content is from 67 wt% to 75 wt%.

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11. A retardation film according to claim 1, wherein the b* value representing the object color is 1.3 or smaller.

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12. A retardation film according to claim 1, which is a $\lambda/4$ plate.

13. A retardation film according to claim 1, which is a $\lambda/2$ plate.

14. A retardation film according to claim 12 or 13, wherein R(550) \geq 90 nm.

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15. A laminated retardation film prepared by laminating a $\lambda/4$ plate and a $\lambda/2$ plate, wherein both the $\lambda/4$ plate and $\lambda/2$ plate are a retardation film according to claim 1.

35 16. A laminated retardation film according to claim 15, wherein the angle formed between the optical axes of

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the $\lambda/4$ plate and $\lambda/2$ plate is in the range of 50°-70°.

17. A circular polarizing plate or elliptical polarizing plate prepared by laminating a polarizing plate with a retardation film according to claim 1.

5 18. A circular polarizing plate or elliptical polarizing plate prepared by laminating a reflective polarizing plate with a retardation film according to claim 1.

10 19. A circular polarizing plate or elliptical polarizing plate prepared by laminating a polarizing plate with a retardation film according to claim 1 and a reflective polarizing plate.

15 20. A circular polarizing plate or elliptical polarizing plate according to claim 18 or 19, wherein said reflective polarizing plate has a function of reflecting only circularly polarized light rotated in one direction.

20 21. A circular polarizing plate or elliptical polarizing plate according to claim 20, wherein said reflective polarizing plate is composed of a cholesteric liquid crystal polymer.

22. A liquid crystal display device provided with a retardation film according to claim 1.

25 23. A liquid crystal display device according to claim 22, which is a reflective liquid crystal display device.

24. A liquid crystal display device according to claim 22, wherein said retardation film is a viewing angle compensating plate.

30 25. A retardation film which is a retardation film comprised of a single polycarbonate oriented film, wherein the retardation at wavelengths of 450 nm and 550 nm satisfies the following formula (1):

$$R(450)/R(550) < 1 \quad (1)$$

35 where R(450) and R(550) represent the in-plane retardation of the oriented polymer film at wavelengths of 450 nm and 550 nm, respectively,

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and $R(550)$ is at least 50 nm.

26. A reflective liquid crystal display device provided with a polarizing plate, a $\lambda/4$ plate and a liquid crystal cell containing a liquid crystal layer between two substrates with transparent electrodes in that order, the reflective liquid crystal display device employing as the $\lambda/4$ plate a retardation film comprising a single oriented polycarbonate film, wherein the retardation at wavelengths of 450 nm and 550 nm satisfies the following formula (1):

$$R(450) \times R(550) < 1 \quad (1)$$

where $R(450)$ and $R(550)$ represent the in-plane retardation of the oriented polymer film at wavelengths of 450 nm and 550 nm, respectively,
and $R(550)$ is 100-180 nm.